and is like a gem of deep blue-green color in a setting of lofty, jagged mountains, whose lower parts are good farms well watered by countless falls and brimming brooks. The other is Gudvangen and Stalheim, which we reached by driving eight miles up the Naeroedal, a valley at the base of mountains 4,000–5,000 ft. almost sheer from sea level, and so close together that our necks ached with the effort of seeing their summits. At the end of the drive we walked up the winding road to the Stalheim cliff and hotel, from which we had a fine view down the narrow valley and the many mountains one behind the other until they faded into the blue distance. Those two places were a fitting conclusion to a most interesting journey and are within easy reach of Bergen. In the little botanical garden in Bergen I found in flower and named some of the plants I had noticed in the yard of the man in Reykajavik.

I am indebted to Mr. Rydberg for naming the plants I brought back, which are now in the New York Botanical Garden herbarium.

NOTES ON UROMYCES

By John L. Sheldon

In the spring of 1906, I found an *Uromyces* on a number of plants of *Sisyrinchium graminoides* Bick., usually associated with *Aecidium houstoniatum* Schw. on *Houstonia caerulea* L. Mention has been made of this in a previous number of Torreya,[1] together with a description of the *Uromyces* and the results obtained from inoculations made in the field. Observations and inoculation have been kept up for the past three years. Successful inoculations of plants of *Sisyrinchium graminoides*, with aecidiospores from *Houstonia cærulea*, have been obtained each year. During the winter and spring of 1907, I finally succeeded in obtaining aecidia on a few plants of *Houstonia caerulea*, grown in the greenhouse and inoculated with teleutospores from *Sisyrinchium graminoides*. These results showed that the *Uromyces* and the *Aecidium* are different stages of the same rust. And

[1] A rare Uromyces. Torreya 6 : 249–250. D 1906.

according to the system of nomenclature in use at the present time, the name becomes *Uromyces houstoniatus* (Schw.) n. n. If the system of nomenclature proposed by Professor J. C. Arthur is followed, then the name becomes *Nigredo houstoniata* (Schw.) n. n.

One of the most interesting things in the life history of this rust is that the teleutospores germinate in the living leaves of *Sisyrinchium* and probably infect plants of *Houstonia* during the summer and autumn, the mycelium remaining dormant until the following spring when aecidia develop. In so far as I have been able to ascertain, species of *Uromyces*, whose teleutospores germinate in living leaves, rarely have an aecidial stage.

I have tried several times to inoculate *Sisyrinchium graminoides* with aecidiospores from *Houstonia purpurea* L., both in the field and the greenhouse, but without definite success. Whether the plants were not susceptible at the time the inoculations were made, or whether the *Aecidium* of *H. purpurea* is not the same as the one of *H. caerulea*, I am unable to say. I have shown elsewhere* that there is considerable difference in the susceptibility of plants to infection by rusts, even the same plant, at different times. I have repeatedly observed a marked difference in the susceptibility of *Trifolium pratense* L., *T. hybridum* L., and *T. repens* L. to infection by *Uromyces trifolii* (A. & S.) Wint. When one of these was seriously injured by the rust, the other two, growing beside it so that their leaves intermingled, were not affected by the rust.

Last spring I noticed that there were abundant aecidia on a blue violet growing beside *Andropogon virginicus* L. having *Uromyces andropogonis* Tracy on the dead leaves and stems. To test whether the *Aecidium* was related to the *Uromyces*, pieces of the rusted grass were collected and taken to the laboratory. The next day the pieces of grass were distributed through five clumps of the same kind of violet. Two weeks later yellow spots began to appear on the leaves of each clump, followed by aecidia. In all probability, aecidia on certain species of *Viola* have been determined as those of *Puccinia violae* (Schum.) DC.

* Preliminary studies on the rusts of the asparagus and the carnation : Parasitism of *Darluca filum*. Science, N. S. 16 : 397. 235–237. 8 Ag 1902.

when they should have been determined as those of *U. andropogonis.*

West Virginia University,
Morgantown, West Virginia

REVIEWS

Willis's Flowering Plants and Ferns*

The publication of a third edition calls attention to this handbook in the Cambridge Biological Series as a book which is probably not so widely known in this country as its usefulness might warrant. The preface states that the book is aimed to supply such information about the plants met with in a botanical garden or museum, or in field work, as is required by any but specialists. The introduction contains helpful notes on field work and collecting. Following this, about one hundred pages are occupied with a brief and somewhat categorical account of general morphology and physiology, the paragraphs on nutrition, in particular, being rather inadequate. The constant emphasis on the phylogenetic point of view gives the discussion of morphology a suggestive value for teachers. This standpoint is further emphasized in the chapter on evolution and classification. In a two-page note at the end of the first part, the author announces his conversion to the theory of mutation, giving a brief but effective apology for this change during the publication of the work. The other chapters of this part are devoted to useful summaries of plant geography and economic botany.

The second and larger part of the book (covering over 400 pages) is a dictionary of "the classes, cohorts, orders, and chief genera of the flowering plants and ferns." It is unfortunate that this "provincial" group-terminology is retained, in view of the general use in America and in the best Continental works of the terms order and family, as prescribed in the Vienna Code, though even the makers of that Code had not arrived at a full appreciation of the desirability of uniformity in ordinal terminations.

* Willis, J. C. A Manual and Dictionary of the Flowering Plants and Ferns. 12 mo. Pp. xii + 714. 1908. [3d ed.] Cambridge, University Press.